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Docket No.: 84655US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jonathon M Schuler et al.

Application No.: 10/808,267

Confirmation No.: 4786

Filed: March 11, 2004

Art Unit: 2621

For: Algorithmic technique for increasing the spatial
acuity of a focal plane array electro-optic
imaging system

Examiner: P. L. Edwards

SECOND INFORMATION DISCLOSURE STATEMENT (IDS)

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed more than three months after the U.S. filing date, OR more than three months after the date of entry of the national stage of a PCT application, AND after the mailing date of the first Office Action on the merits, whichever occurs first, but before the mailing date of a Final Office Action or Notice of Allowance (37 CFR 1.97(c)).

Applicant has not submitted copies of each cited U.S. patent and U.S. patent application as required by 37 CFR 1.98(a)(2)(i), amended October 2004, as the U.S. Patent and Trademark Office has waived this requirement for all U.S. patent applications. Applicant submits herewith copies of foreign and non-patents in accordance with 37 CFR 1.98(a)(2).

12/22/2005 HALI11 00000113 500281 10808267

01 FC:1806 180.00 DA

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

Please charge our Deposit Account No. 50-0281 in the amount of \$180.00 covering the fee set forth in 37 CFR 1.17(p). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-0281, under Order No. 84655US1. A duplicate copy of this paper is enclosed.

Dated: December 15, 2005

Respectfully submitted,

By Sally A. Ferrett
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FEE TRANSMITTAL For FY 2005		Complete if Known	
		Application Number	10/808,267-Conf. #4786
		Filing Date	March 11, 2004
		First Named Inventor	Jonathon M Schuler
		Examiner Name	P. L. Edwards
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27		Art Unit	2621
TOTAL AMOUNT OF PAYMENT		(\$)	180.00
		Attorney Docket No.	84655US1

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

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For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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☐ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)** **Multiple Dependent Claims**

_____ - = _____ x _____ = _____ **Fee (\$)** **Fee Paid (\$)**

Indep. Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)**

_____ - = _____ x _____ = _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____	_____	_____ /50 _____ (round up to a whole number) x _____	_____	_____

4. OTHER FEE(S)

	Fees Paid (\$)
Non-English Specification, \$130 fee (no small entity discount)	
Other (e.g., late filing surcharge): 1806 Submission of an Information Disclosure Statement	180.00

SUBMITTED BY

Signature	<u>Sally A Ferret</u>	Registration No. (Attorney/Agent)	46,325	Telephone	(202) 404-1551
Name (Print/Type)	Sally A. Ferret	Date	December 15, 2005		



PTO/SB/08a/b (07-05)

Approved for use through 07/31/2006. OMB 0651-0031
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Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
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				Art Unit	2621
				Examiner Name	P. L. Edwards
Sheet	1	of	3	Attorney Docket Number	84655US1

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁸
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				

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NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		HUANG, T. S. and TSAI, R.Y., "Multiple frame image restoration and registration", Advances in Computer Vision and Image Processing, vol. 1, JAI Press, 1984 TEKALP, A. M., Digital Video Processing, pages 81-86 & table of contents, 1995 Prentice Hall RICHARDSON, W.H., "Baysian-Based Iterative Method of Image Restoration", J. Opt. Soc. Am., vol. 62, no. 1, page 55-59 (1972) DIXON, D.D. et al., "Pixon-based Deconvolution", Astronomy and Astrophysics Supplement Series, Vol. 120, pages 683-686 (1996) JAIN, A.K., Fundamentals of Digital Image Processing, Chapter 8 and table of contents, pages 267-341, Prentice Hall 1989 J. M. SCHULER, J. G. HOWARD, P. R. WARREN, and D. A. SCRIBNER, "TARID-based adaptive nonuniformity correction", Proc. SPIE Int. Soc. Opt. Eng., Volume 4719, page 240-246, 2002 J. M. SCHULER, J. G. HOWARD, P. R. WARREN, and D. A. SCRIBNER, "TARID-based image super-resolution", Proc. SPIE Int. Soc. Opt. Eng. 4719, 247-254 (2002) J. M. Schuler, J. G. HOWARD, P. R. WARREN, and D. A. SCRIBNER, "Scene-adaptive nonuniformity correction using TARID-composite image prediction", Proc. SPIE Int. Soc. Opt. Eng. 4671, 888-894 (2002)	
Examiner Signature			Date Considered

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Sheet	2	of	3	Attorney Docket Number	84655US1

		<p>J. M. SCHULER, J. G. HOWARD, P. R. WARREN, and D. A. SCRIBNER, "Resolution enhancement through TARID processing", Proc. SPIE Int. Soc. Opt. Eng. 4671, 872-876, (2002)</p> <p>J. M. SCHULER, J. G. HOWARD, P. R. WARREN, and D. A. SCRIBNER, "Robust tie-point registration of disparate imaging sensors by matching optical flow" Proc. SPIE Int. Soc. Opt. Eng., Volume 4671, pages 775-783 (2002)</p> <p>J. M. SCHULER, J. G. HOWARD, D.A. SCRIBNER, P. R. Warren, R. B. KLEIN, M.P. SATYSHUR, and M. R. KRUEER, "Resolution enhancement through a temporal accumulation of registered video", Proc. SPIE Int. Soc. Opt. Eng., Volume 4372, pages 137-142 (2001)</p> <p>J.M. SCHULER, J. G. HOWARD, D.A. SCRIBNER, P.R. Warren, R. B. KLEIN, Michael P. SATYSHUR, and M.R. KRUEER, "Analytic registration of spatially and spectrally disparate co-located imaging sensors achieved by matching optical flow", Proc. SPIE Int. Soc. Opt. Eng., Vol. 4381, pages 265-274 (2001)</p> <p>J.M. SCHULER, J. G. HOWARD, D.A. SCRIBNER, P.R. Warren, R. B. KLEIN, M. P. SATYSHUR, and M.R. KRUEER, "Multiband E/O color fusion with consideration of noise and registration", Proc. SPIE Int. Soc. Opt. Eng. 4029, pages 32-40 (2000)</p> <p>D.A. SCRIBNER, J.M. SCHULER, P.R. WARREN, J. G. HOWARD, and M. R. KRUEER, "Image preprocessing for the infrared" Proc. SPIE Int. Soc. Opt. Eng., Vol. 4028, pages 222-233 (2000)</p> <p>J. G. HOWARD, P. R. WARREN, R. KLEIN, J.M. SCHULER, M. P. Satyshur, D. A. Scribner, and M. R. Kruer, "Real-time color fusion of E/O sensors with PC-based COTS hardware", Proc. SPIE Int. Soc. Opt. Eng., Vol. 4029, pages 41-48 (2000)</p> <p>J. M. SCHULER, D. A. SCRIBNER, and M. R. KRUEER, "Alias reduction and resolution enhancement by a temporal accumulation of registered data from focal plane array sensors", Proc. SPIE Int. Soc. Opt. Eng., Vol. 4041, pages 94-102 (2000)</p> <p>J. M. SCHULER and D.A. SCRIBNER, "Increasing spatial resolution through temporal super-sampling of digital video", Opt. Eng., Vol. 38, Issue 5, pages 801-805 (1999)</p> <p>D.A. SCRIBNER, J.M. Schuler, P.R. Warren, M.P. Satyshur, and M. R. Kruer, "Infrared color vision: separating objects from backgrounds" Proc. SPIE Int. Soc. Opt. Eng., Vol. 3379, pages 2-13 (1998)</p> <p>R.R. MAYER, J. WATERMAN, J. SCHULER, and D. SCRIBNER, "Spectral optimization studies and schemes to enhance target detection and display for a three-band staring LWIR sensor" Proc. SPIE Int. Soc. Opt. Eng., Vol. 5159, pages 20-31 (2003)</p>	
Examiner Signature		Date Considered	

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				Art Unit	2621
				Examiner Name	P. L. Edwards
Sheet	3	of	3	Attorney Docket Number	84655US1

	<p>R. G. DRIGGERS, K. KRAPELS, S. MURRILL, S. YOUNG, M. THIELKE, and J. SCHULER, "Superresolution performance for undersampled imagers", Opt. Eng., Vol. 44, pages 014002-1-14002-9 (2005)</p> <p>K.A. KRAPELS, R.G. DRIGGERS, S. MURRILL, J. M. SCHULER, M. THIELKE, and S. S. YOUNG, "Superresolution performance for undersampled imagers", Proc. SPIE Int. Soc. Opt. Eng., Vol. 5407, pages 139-149 (2004)</p> <p>KONDI, L. P., Scribner D.A. and Schuler, J. M., "Comparison of digital image resolution enhancement techniques", Proc. SPIE Int. Soc. Opt. Eng., Vol. 4719, pages 220-229 (2002)</p> <p>JAIN, D. "Superresolution using Papoulis-Gerchberg Algorithm", [online], [retrieved on 2005-12-15], retrieved from the internet < URL: http://www.stanford.edu/class/ee392j/student_projects_2004.html></p> <p>Schuler, J.M., Scribner, D.A., "Dynamic Sampling, Resolution Enhancement, and Super Resolution", in Analysis of Sampled Image Systems, Tutorial Texts in Optical Engineering; Volume TT39; editors: Vollmerhausen, R.H., Driggers, R.G.; series editor: Donald O'Shea; SPIE Press, pages 125-138, (2000)</p>	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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